

Claims

1. A method to safely transport peroxide formulation in containers having a size greater than 1 litre, characterised in that the containers are filled with:

- from 90 to 1%w/w of one or more peroxides selected from the group consisting of peroxyesters, including peroxyester derivatives of ketone peroxides, peroxycarbonates, including peroxycarbonate derivatives of ketone peroxides, diacylperoxides with from 1 to 48 carbon atoms, diperoxyketals, trioxepans, dialkylperoxides, mixed peroxides, and mixtures of any two or more of these peroxides,
- from 10 to 99%w/w of one or more phlegmatisers with a (joint) flash point greater than 5°C and a (joint) boiling point that is more than 60°C higher than the self-accelerating decomposition temperature of the peroxide formulation, said phlegmatiser being selected from the group of compounds that react effectively in the polymerisation process,
- 0-75%w/w of optional conventional phlegmatisers, up to a total of 100%

with the proviso that it is not a formulation of tert.butyl peroxy maleate with dibutylmaleate.

2. A method to produce a polymer by means of a radical polymerisation process wherein at least 25%w/w of the phlegmatiser that was used to phlegmatise the peroxide or peroxides used as a source of free radicals in said process is reacted such that it is not extractable from the polymer by transporting a peroxide formulation-containing container according to claim 1 to the polymerisation unit and introducing its content into the polymerisation process.

3. The method according to claim 2 wherein the polymerisation process is a high-pressure ethylene (co)polymerisation process.

4. The method according to claim 2 wherein the polymerisation process is a suspension styrene (co)polymerisation process.

5. The method according to claim 3 wherein the reactive phlegmatizer is selected from the group of (cyclic) olefins, aldehydes, ketones, alcohols, and mixtures thereof.

6. The method according to claim 5 wherein the reactive  $\alpha$ -olefins are selected from the group consisting of 1-hexene, 1-heptene, 1-octene, 1-nonene, 1-decene, 1-undecene, 1-dodecene, and mixtures thereof.

7. The method according to claim 4 wherein the reactive phlegmatizer is  $\alpha$ -methyl styrene.

8. A method according to any one of the preceding claims wherein the peroxide is selected from the group consisting of 1,1,4,4-tetramethylbutyl-1,4-di(peroxy-2-methylpropanoate), tert-butylperoxy neodecanoate, tert-amylperoxy neodecanoate, 1,1,3,3-tetramethyl butyl-1-peroxy neodecanoate, 1,1-dimethyl-3-hydroxy butyl-1-peroxy neodecanoate, tert-butylperoxy pivalate, tert-amylperoxy pivalate, 1,1,3,3-tetramethyl butyl-1-peroxy pivalate, 1,1-dimethyl-3-hydroxy butyl-1-peroxy pivalate, tert-butylperoxy 2-ethylhexanoate, tert-amylperoxy 2-ethylhexanoate, 1,1,3,3-tetramethyl butyl-1-peroxy 2-ethylhexanoate, 1,1-dimethyl-3-hydroxy butyl-1-peroxy 2-ethylhexanoate, tert-butylperoxy benzoate, tert-amylperoxy benzoate, 1,1,3,3-tetramethyl butyl-1-peroxy benzoate, 1,1-dimethyl-3-hydroxy butyl-1-peroxy benzoate, tert-butylperoxy 3,3,5-trimethylhexanoate, tert-amylperoxy 3,3,5-trimethylhexanoate, 1,1,3,3-tetramethyl butyl-1-peroxy 3,3,5-trimethylhexanoate, 1,1-dimethyl-3-hydroxy butyl-1-peroxy 3,3,5-trimethylhexanoate, tert-butylperoxy isobutyrate, tert-amylperoxy isobutyrate, 1,1,3,3-tetramethyl

butyl-1-peroxy isobutyrate, and 1,1-dimethyl-3-hydroxy butyl-1-peroxy isobutyrate, dialkylperoxides, preferably di-tert-butyl peroxide, tert-butyl tert-amyl peroxide, and di-tert-amyl peroxide, and diacylperoxides, (preferably, bis(3,3,5-trimethylhexanoyl) peroxide.

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9. A polymerization process wherein one or more peroxide formulations that were handled in accordance with any one of claims 1 – 8 is used as a source of free radicals.

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10. A polymer modification process wherein one or more peroxide formulations that were handled in accordance with any one of claims 1 – 8 is used as a source of free radicals.

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